

KEYS

TO PROFITABLE PRODUCTION

KEYS TO PROFITABLE COTTON PRODUCTION IN THE COASTAL BEND



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KEYS TO PROFITABLE COTTON PRODUCTION IN THE COASTAL BEND

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The Coastal Bend, located in the mid-Gulf Coast region of Texas, includes the cotton growing areas of Kleberg, Jim Wells, Nueces, San Patricio, Aransas, Bee, Refugio and Calhoun counties. In this region the cotton acreage fluctuates from 150,000 to 300,000 acres. A dramatic shift from long season, picker-type varieties to stripper types has occurred in recent years. Currently approximately 95 percent of the acreage utilizes short season production practices including the popular variety Tamcot SP-37.

Cotton yields have increased in the past 5 to 6 years and now average 450 to 480 pounds per acre. Cotton produced in this region has certain marketing advantages because it is among the earliest cotton harvested in the cotton belt.

This region's climate is subtropical with an average annual rainfall ranging from 26 to 38 inches. However, annual precipitation can vary greatly depending upon drought cycles and rainfall from tropical disturbances from mid-August to late September. Weather records indicate there are approximately 250 days suitable for growing cotton, but the mandatory stalk destruction deadline to control the pink bollworm reduces the period to 180 days or less. The increasing probability of rainfall in late August and September makes it advantageous to complete harvest by mid-August. The advantage of earlier harvest has been more fully realized with the adoption of short season production system.

Cotton producers in this region face a number of management problems including insects, diseases, salinity, fertility, weeds and untimely rains during the harvest season. This fact sheet includes some recommendations to minimize production problems and improve net profit.

Land Preparation

Begin preparation immediately after harvest by shredding and plowing up stalks to meet the deadline set by the State Pink Bollworm Control Program. Refer to the Extension Service leaflet L-219 *Ways to Fight the Pink Bollworm in Texas* for the proper stalk destruction deadline and planting periods. Early stalk destruction and land preparation in August also reduce the number of overwintering boll weevils. Thorough shredding of high-residue crops aids in plowing under crop residue, precision planting, weed control, fertilizer application, bed shaping and cultivation with rotary hoes or sleds. Plow all cotton stalks, boll residues and volunteer cotton under to a minimum depth of 6 inches. This practice hastens residue decomposition and helps in reducing over-wintering boll weevils and pink bollworms.

When possible, follow a 3-year rotation with cotton, grain sorghum, corn or flax. A sound crop rotation program plays a key role in reducing diseases, weeds and insect problems. Also, make maximum use of plant residues and animal manures to maintain adequate organic matter and soil tilth which in turn aids in preparing a good seedbed.

Apply preplant incorporated herbicides in early November or December according to the herbicide label. Before applying preplant herbicides and becoming committed to cotton, establish a firm price through forward contracting or other marketing method. This allows more flexibility in cropping decisions before planting. When uncertain about the cotton market during the fall it may be advisable to use preemerg herbicides. Consider using these herbicides or banding applications when carry-over is a problem and residue needs to be maintained at a minimum level with certain crop rotation programs.

Chisel, plow or disk early to conserve August to September rainfall. Early listing or bedding for final seedbed preparation allows time for moisture storage

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and the soil to firm before planting. To reduce moisture losses, a rotary hoe or row disk may substitute for rebedding to control weeds. If rebedding is necessary, complete this practice before November. Excessive land preparation in the spring cannot always be avoided, but hold it to a minimum to conserve soil moisture for planting.

Fertilization

Base every fertilization program on reliable soil test and cropping history. Soils vary greatly in nutrient requirement. While clay and clay loam soils generally are fertile, lighter soils have a greater nitrogen and phosphorus requirement. A few soils may require potassium. Cotton following heavy nitrogen fertilization on sorghum or corn the previous year or when fields have been fallowed for 6 months may not require nitrogen.

Applying 40 to 60 pounds of nitrogen normally is adequate for profitable yields. Tall, vegetative cotton and delayed fruiting often are attributed to excessive nitrogen fertilization and/or too much soil moisture. These conditions can detract from the goals of the short season production systems.

Soil analysis summaries from the Coastal Bend counties indicate 45 to 50 percent of the soils require phosphorus for profitable cotton production. Phosphorus needs may vary greatly on individual fields and farms; therefore, a soil test is the most reliable guide to determine phosphorus requirements. Soils low in phosphorus require 20 to 40 pounds of P_2O_5 per acre. For best response, apply phosphorus in a band at soil depths near the permanent root zone. Micronutrients applied foliar or in soil have not proven profitable in this region, but as cropping continues this could change.

Variety and Planting Seed

Varieties play a key role in profitable cotton production in this region. Important variety traits include rapid fruiting, determinant, high yield and quality fiber. The variety also should be adapted to the harvest method. Late indeterminate varieties are more likely to produce a large stalk which causes difficulty in stripper harvest. These varieties are also not suitable for the short season production systems.

Since many new varieties have become available in recent years, consult your County Demonstration Handbook, Experiment Station Variety Tests and USDA Regional Variety Tests to determine varieties with consistent performance. Early, rapid fruiting varieties are now available with multiradversity resistance, high yield potential and desirable fiber properties. Currently the Tamcot SP-37 and SP-21 varieties occupy a large portion of the acreage in this region.

Make every effort to plant quality seed with high seed density that have been processed and stored properly. Know the quality of seed being planted. Do not use low germinating seed or seed with high free-fatty acid levels. Small seed produced under moisture stress often give erratic stands, especially if planted too deep. Also avoid planting mechanically damaged seed or seed stored under high moisture conditions. To obtain high quality seed, save planting seed only from dry seed cotton. Seed cotton in open bolls exposed to prolonged periods of wet weather before harvest should not be saved for planting. When purchasing seed, deal with a reputable seed company or delinting plant.

Seed Bed and Planting Operation

Plant as soon as moisture and soil temperature conditions are favorable. Soil temperature should be at least 60° F at the 4-inch depth for 3 consecutive days with a favorable 5-day forecast. Plant in shaped beds (30 to 40-inch width) with precision depth control planters rather than furrow planting. Advantages of shaped bed planting are: power requirements are less, soil temperature is 3 to 4 degrees higher, minimum soil disturbance helps conserve moisture, depth control of seed placement is more precise with less scatter pattern in the drill and there is a significant increase in planting speed and capacity. Seed germination is more rapid and rapid seedling growth encourages early crop maturity on beds. More precise post-emergence weed control operations such as DSMA application to grass and weeds is another advantage of bed planting.

Follow the optimum planting dates recommended in *L-219 Ways to Fight the Pink Bollworm in Texas*. Generally, the highest yields are obtained from plantings conducted the last week in February and the first 2 weeks in March. Plant early maturing varieties early to obtain full yield potential. Because of high insect control cost and unfavorable harvesting conditions associated with late planting, cotton planted in May usually is too late to be profitable and should be avoided.

A proper stand is important in profitable cotton productions. Plant four to six seed per row foot in 40-inch rows to obtain an optimum stand of three to four plants per row foot. The final plant population should be 45,000 to 65,000 plants per acre. For 30-inch row width, similar plant populations as above are adequate, but should not exceed 70,000 plants per acre. In areas subject to sand erosion, use a steel or rubber roller 1 or 2 days following planting. This practice conserves moisture and improves preplant and post-emergence weed control.

Insect Control

Insect pest management includes the use of certain cultural practices, frequent field scouting, biolog-

ical control through conservation of natural beneficial insects and selected use of insecticides to keep insect pest populations below damaging levels. Cultural practices which reduce late season insect damage and insecticide treatments include early uniform planting, optimum nitrogen use, minimum irrigation (where used) and use of short season cotton varieties. These practices plus thorough post-harvest stalk destruction reduce the period in which cotton is vulnerable to insect attack.

The most important part of a pest management program is the survey for insects, damage and fruit development through regular field scouting. Conduct field inspections every 4 to 7 days. For scouting methods, economic threshold levels and insecticides see L-218 *Management of Cotton Insect Pests in South and East Texas Counties*.

The first 30 days of blooming are critical for optimum, early boll set. The earliness factor in short season production can be lost where damaging populations of fleahoppers occur as the first squares are formed. Loss of first squares to overwintered boll weevils also detracts from short season production. Control both of these insects with insecticides when they occur in damaging numbers. Scout fields often to determine pest population levels and damage, beneficial insect numbers and fruiting rate.

Overwintered boll weevils emerge from winter hibernation and enter cotton early in the season. They occur in very low numbers and females do not effectively lay eggs until first squares are about ¼ inch in diameter (one-third grown). Insecticides applied at this time help suppress boll weevil population build-up until after peak bloom. **CAUTION:** To determine if this practice is applicable on your farm, read carefully L-218 referred to above.

Bollworms, tobacco budworms, pink bollworms and boll weevils are the principal insect pests in mid and late season. The major objective of a well planned pest management program is to avoid having to treat for these pests, though many times this cannot be avoided. Cotton grown under heavy irrigation and fertilization prolongs plant growth and is more subject to damage late in the season from these insect pests.

Natural populations of beneficial insects and spiders often effectively control cotton pests such as the bollworm, tobacco budworm, cotton aphid and spider mite. Therefore, before applying insecticides monitor beneficials to determine if they are adequately suppressing pest populations.

Early harvest and stalk destruction is the most important cultural practice in a pest management program. This practice reduces habitat and food available to the boll weevil, pink bollworm, bollworm and tobacco budworm. Thus the purpose of a pest management program is not only to reduce insect populations during the production season, but also to reduce

the period when cotton is available to the pests. *If a thorough stalk destruction program is not carried out, benefits of the pest management program can be nullified.*

Disease Control

Treat seed with one of the following protectant fungicides:

Table 1. Protectant fungicides for treating cottonseed

Chemical	Machine oz/100 lb of seed	Acid oz/100 lb of seed
Busan 72 (60%)	3.5	3
Demosan (65%)		
+ Busan (60%)	10 + 3	10 + 2
+ Thiram (70%)		10 + 3
PCNB (75%)		
+ Captan (75%)	4 + 3	4 + 2
PMA (7%)	3	2
Terracoat 21	16	12
Thiram (70%)	3	3
Vitavax (75%)		
+ Captan (75%)	4 + 3	4 + 2
or		
+ Thiram (70%)	4 + 3	4 + 3

When buying planting seed, make sure seed are treated. Check the tag to determine the type of protectant fungicide used.

Seedling disease. Use high-quality seed. Keep crop residue out of the seedling zone. Use bed planting for more rapid seedling emergence. If seedling disease is a consistently serious problem, use an in-furrow fungicide such as PCNB + Captan, Terraclor Super X, Panterra, Difolatan or Demonsan at planting time.

Bacterial blight. Use a resistant variety. The "SP" varieties have good resistance to bacterial blight. Use acid-delinted, treated seed to eliminate the seed-borne bacteria and rotate cotton with other crops. Avoid excessive rates of nitrogen fertilizer.

Root-knot nematodes and fusarium wilt. Plant tolerant varieties. For reuniform nematodes, rotate at least 2 years with grain sorghums. Do not use corn in rotation. Apply fumigants 18 inches deep before planting. Telone (8 gallons per acre) or D-D (10 gallons per acre) directed at stands in the beds gives good control. Use these practices only when the nematode level is well established and control is economically justified.

Cotton root rot. General root rot control practices used for many years which still merit recommendations include the following points:

- Follow a crop rotation program with fibrous-rooted crop such as small grain and sorghum.
- Deep plow early during dry conditions and turn all plant residue under.

- Plant rapid fruiting varieties early to help escape the disease.

Weed control. Combine herbicides with mechanical methods to insure a successful weed control program and reduce cost. Select herbicides on the basis of specific weed problems encountered in each field with consideration given to crops in rotation.

Basalin®, Prowl®, Treflan® and Tolban® are suggested for controlling seedling Johnsongrass, annual grasses and broadleaved weeds such as pigweed (carelessweed), lambsquarter and purslane. Thoroughly incorporate these materials with a power rototiller, rolling cultivator, bed conditioner or two passes with a disk.

Avoid bedding too deep, a practice that removes treated soil from middles. Plant with equipment that will not remove all the treated soil from the planted row. Plant seed near the bottom edge of the treated soil zone.

If rhizome Johnsongrass is a severe problem, consider applying Treflan® or Tolban® at a double rate for 2 consecutive years. Closely follow label directions to insure control and avoid injury to the cotton and crops in rotation.

Preemergence herbicides for use after planting but before cotton emerges include Caparol®, Cotoran®, Dacthal®, Dynex®, Karmex®, Lanex®, Sancap® and Surflan®. These herbicides are dependent upon rainfall to move into the soil where weed seed are germinating. When ½ inch of rain or more is received within 10 to 14 days after application, these herbicides normally perform very well. Consistent control of seedling Johnsongrass and large seeded annual grasses, such as Texas panicum (Coloradograss), cannot be expected with these herbicides. Apply all of these herbicides on a band over the row to reduce costs and herbicide carryover.

If morningglory and other large seeded broadleaved weeds occur in fields also infested with grass, apply a preplant incorporated herbicide, followed at planting with a band application of preemergence herbicide.

Post-emergence herbicides may be necessary, especially in fields heavily infested with grass and in years when wet weather prevents cultivation and application of preplant or preemergence herbicides. The key to effective control is timely application. Weeds should not be more than 2 to 4 inches tall when making post-emergence applications.

Suggested post-emergence herbicides include Caparol®, Dynex®, Karmex®, Lanex® and Probe®; add to surfactant for best control. Cotoran®, Dynex®, Karmex® and Lanex® may be mixed with DSMA or MSMA to control broadleaved weeds and grasses. Caparol® and Probe® may be mixed with MSMA. If grasses are the only problem, DSMA or MSMA may be applied alone. Direct these herbicides

at the base of the cotton plants for maximum effectiveness and safety. Yields may be reduced if DSMA and MSMA are applied after cotton has started blooming or when cotton is under severe moisture stress. Round up®, a contact herbicide, may be used as a preplant and/or through a recirculating sprayer. Primary usage will be to control rhizome johnsongrass, bermudagrass, shattercane, cocklebur, sunflower and milkweed.

For details concerning other treatments and herbicide application rates, see MP-1059B *Suggestions for Weed Control with Chemicals in Cotton* at the county Extension office.

Consult product labels before applying any herbicide.

Harvesting, Handling and Ginning to Preserve Quality

This important phase of cotton production involves correct adjustment of pickers and strippers and proper crop preparation for harvest with harvest-aid chemicals. Since trash in seed cotton contains considerably more moisture than the lint or seed, the main objective is to minimize the trash content to maintain low moisture levels. Harvested seed cotton should have a moisture content less than 12 percent (optimum 8 to 10 percent) to prevent deterioration of lint and seed quality during storage. Cotton harvested during the early morning or late evening period should go directly to the gin for processing. As a general rule, harvest when the relative humidity is less than 60 percent. At this humidity level the moisture content of the seed cotton is 8 percent or less. Once the cotton has become wet in the field, it may require several days for the moisture content to drop to the level for proper harvest. If wet cotton is harvested, do not mix with dry cotton.

Chemical defoliant such as the organic phosphates and sodium chlorates cause abscission or shedding of leaves earlier than normal, but it does not necessarily kill the entire plant. Defoliant, used primarily to prepare the crop for picker harvest, serve two important purposes: 1) removal of leaves to facilitate machine harvest and lower the moisture content of the seed cotton taken to the gin and 2) prevention of green leaf stain on the lint. Apply defoliant when 60 percent or more of the bolls are open. Applications made too early can lower lint quality and yield. Desiccants such as arsenic acid and Paraquat® are chemicals that kill plant tissue and cause rapid loss of water from the foliage. Most leaves remain attached. Desiccation is required when the cotton is to be machine stripped to insure that bolls break free. Do not apply desiccant until 85 percent or more of the bolls are open. For further information on the use of harvest-aid chemicals see

L-145 *Cotton Defoliation Guide* at your county Extension office.

Gin turn-out is the ratio of weight of recovered lint to the weight of field run seed cotton. For example, gin turn-out of 30 percent means that approximately 1,600 pounds of seed cotton are required at the gin to obtain 480 pounds of lint. Excessive trash reduces gin turn-out, increases ginning costs and usually lowers the final grade. Average turn-out for machine-picked cotton should be 30 to 36 percent and 20 to 25 percent for machine-stripped cotton.

Harvest cotton as quickly as possible after it opens. Any delay in harvesting can result in lower grade from field deterioration of seed cotton especially if long periods of adverse weather are encountered. With the increased capacity in stripper harvesting, gins are not able to process seed cotton at the same rate that it is harvested. The cost of gin equipment to increase capacity for peak harvest is prohibitive. Labor and energy costs at gins have risen and are likely to bring about a shorter work week and a longer gin season. Hence seed cotton storage is a necessity and will become more important in the future.

Ricking and module building are two new methods developed to allow storage of seed cotton. During favorable weather these new storage and handling methods allow the producer to maintain a peak harvesting rate even though he may have exceeded his trailer capacity. Since ricking is not recommended in humid regions along the Gulf Coast, it is not discussed in this fact sheet.

Module building is the best method of storing seed cotton for preserving lint and seed quality. It consists of forming a seed cotton "module" 24 to 32 feet long and 6 to 9 feet high with a density of 12 to 14 pounds per cubic foot. The module can be transported directly to the gin or stored. Seed cotton with less than 12 percent moisture content (WB) can be stored for 12 months with no loss in lint and seed quality if kept dry. To preserve lint and seed quality, do not module seed cotton if moisture level is high from dews or recent rains or if it contains excessive green leaves from regrowth. Locate modules on well drained areas and cover the seed cotton with a tarp. A 32-foot module of stripped cotton contains approxi-

mately 10 bales, and a 24-foot module of picked cotton contains approximately 10 bales. In some cases, spindle-picked cotton is placed in a 32-foot module and can contain as much as 16 bales. Special module transporters are used to move modules on pallets from the field to the gin or central storage location. There also are special trucks used to move modules formed directly on the ground without pallets.

Gin seed cotton when the lint moisture content is 6 to 8 percent at the feeder apron. Portable moisture meters are available to monitor moisture content at the feeder apron. Excessive drying results in broken fibers and shorter staple length. Insufficient drying reduces the seed cotton cleaning equipment's efficiency, resulting in lower grade and rough preparation. Two stages of lint cleaning are recommended for stripper-harvested cottons. Take care to insure that bale weights are within the TCA no-penalty range.

Profitable cotton production is highly dependent on the marketing strategy and/or marketing system utilized by the producer. Merely "selling" one's cotton in no way assures the producer that he will obtain a price sufficient to provide a positive net return. Several alternatives are available to the producer in his marketing effort. Some of these are the following:

- Forward contracting
- Future market
- Electronic Spot Markets (TELCOT)
- Forward Deliverable Contract Market
- Organized Exchanges
- U.S. Government Loan Program

A good understanding of these alternatives is essential to a profitable marketing scheme. Detailed descriptions of these alternatives can be found in D-1054 *Who Will Market Your Cotton?*, available from the Department of Agricultural Communications, Texas A&M University, College Station, Texas 77843 for 75 cents per copy.

For production cost projections in the Coastal Bend, refer to MP-1027 *Texas Crop and Livestock Budgets*, available at your county Extension office. These budgets are updated annually and reflect the latest advances in cotton production techniques.

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